



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,097	05/19/2006	Patrick Desmond Cunningham	5204-061409	7484

28389 7590 08/24/2009
THE WEBB LAW FIRM, P.C.
700 KOPPERS BUILDING
436 SEVENTH AVENUE
PITTSBURGH, PA 15219

EXAMINER

HAILEY, PATRICIA L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

08/24/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,097

Applicant(s)

CUNNINGHAM ET AL.

Examiner

PATRICIA L. HAILEY

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 05/21/2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Applicants' remarks and amendments, filed on April 22, 2009, have been carefully considered. Claims 22-49 have been canceled; no new claims have been added.

Claims 1-21 remain pending in this application.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on May 19, 2006.

Withdrawn Rejection

The 112(2) rejection of claims 1-21 stated in the previous Office Action has been withdrawn in view of Applicants' persuasive traversing arguments.

New Grounds of Rejection

The following New Grounds of Rejection are being made in view of the Examiner's reconsideration of the instant claims, and in view of the newly discovered references to Cook et al. (U. S. Patent No. 6,986,943) and Li et al. (U. S. Patent No. 5,397,642).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 10, 11, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. (U. S. Patent No. 5,397,642).

Li et al. teach articles comprising a base substrate (which can be in the form of a powder and can be selected from among quartz, silicon, titanium oxide, zinc oxide, indium-tin oxide, coated glass, mica, and glass; see col. 3, lines 26-31; **claims 10 and 21**), having an oxide surface layer for suitable binding of a subsequent material or layer, and a multidentate ligand, capable of binding a metal ion, attached to the oxide surface layer of the base substrate, and additionally either:

- (a) a metal species attached to the multidentate ligand,
- (b) (a) and a multifunctional organic ligand attached to the metal species,
- (c) (b) and a second metal species attached to the multifunctional organic ligand.

See the Abstract of Li et al., as well as col. 3, line 40 to col. 5, line 2, which also discloses that the resultant articles including the base substrate and the multidentate functionality joined through an appropriate linking functionality to the base substrate can have an additional material or monolayer joined to the multidentate ligand, and that said monolayer or material can be an organic moiety layer (col. 4, lines 46-63 of Li et al.).

The base substrate and the oxide surface layer corresponds to Applicants' "metal oxide crystallite particle comprising a plurality of metal and oxygen moieties"; the multidentate organic ligand and multifunctional organic ligand correspond to Applicants' "inner organic binding group" and "outer organic binding group", respectively.

In view of the above teachings, Li et al. anticipate claims 1, 10, 11, and 21.

4. *Claims 1-9 and 11-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Cook et al. (U. S. Patent No. 6,986,943).*

Cook et al. teach surface modified particles prepared by the attachment of a small organic compound to the surface of an inorganic particle, followed by attaching additional compounds to the previously attached organic compounds through organic linking groups. See the Abstract of Cook et al., as well as col. 3, line 31 to col. 4, line 24.

The particles may be inorganic nanoparticles having no dimension greater than 200 nm (2000 Å; **claims 9 and 20**), and may have a surface shell comprising aluminum oxyhydroxide, iron oxyhydroxide, scandium oxyhydroxide, a solid solution of aluminum oxyhydroxide and iron oxyhydroxide (**claims 1 and 14**), clay, or mixtures thereof

(**claims 2 and 15**). The core of these particles may be identical to or different from the surface shell. See col. 5, lines 10-55 of Cook et al., which also provides the formula for aluminum oxyhydroxide (which reads upon **claim 4**).

In a preferred embodiment, the core and shell are a solid solution of aluminum oxyhydroxide and iron oxyhydroxide (**claims 2, 11, 14, and 15**); see col. 6, lines 27-44 of Cook et al.

Surface modification of the particles involves reactions that form a bond (covalent, ionic, hydrogen, surface adsorption, and dipole-dipole interactions) between the particles and what is disclosed by Cook et al. as "the Anchor of Compound A". An additional surface modification can be performed, comprising reactions that form a preferably covalent, organic linkage between "Compound B" and a group on the surface-anchored "Compound A". See col. 6, lines 45-55 of Cook et al. (**claims 3 and 13**).

Compound A is preferably a small molecule containing less than 40 carbon atoms, and comprises at least a reactive anchoring group that reacts with the surface of the particle, and a reactive group (defined as Group 1) that reacts with Compound B. The anchor of Compound A is selected from the group consisting of: a carboxylic acid group, a carboxylate salt, an hydroxyl group, etc. (**claims 5, 6, 12, and 16**). See col. 7, lines 12-28 of Cook et al.

Group 1 (and subsequent Groups, if additional reactions are performed, see col. 7, lines 1-9 of Cook et al.) is a chemical entity capable of undergoing a reaction and

comprises substituents such as those recited in Applicants' **claims 5-8, and 17-19**. See col. 7, line 45 to col. 8, line 42 of Cook et al.

In view of these teachings, Cook et al. anticipate claims 1-9 and 11-20.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA L. HAILEY whose telephone number is (571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/
Primary Examiner, Art Unit 1793
August 21, 2009